

REMARKS

The present application has been amended in response to the Examiner's Office Action to place the application in condition for allowance. Applicant, by the amendments presented above, has made a concerted effort to present claims which clearly define over the prior art of record, and thus to place this case in condition for allowance.

In the Office Action, the Examiner rejected all of the claims under 35 U.S.C. §102(e) citing Hirao (U.S. Patent No. 6,788,082). Hirao discloses a probe card which is used for performing a wafer test and/or chip test of a semiconductor device during its production process (see, for example, col. 1, lines 6-9, 42-43). To perform the test, probe pins on the probe card are brought into contact with a pad surface of a semiconductor chip (see, for example, col. 1, lines 53-56). In contrast, to test the pins on the probe card, the pins are brought into contact with a metal plate 102, and a probe card checker 101 is used to test the pins of the probe card (see, for example, col. 1, lines 48-57). As disclosed in Hirao, such probe cards and methods for testing the pins of a probe card are conventional; however, a problem is the ability to determine exactly which pin on the probe card is defective (see, for example, col. 2, lines 58-67). Hirao's invention is a probe card which includes contact check wires (L_1 through L_N in Figures 2 and 3) connected to the pins of the probe card, for testing the individual pins (see, for example, col. 5, lines 25-46).

Figures 4-6 of Hirao illustrate three possible probe card substrates. As shown, each one includes two sets of contacts - a first set of electrodes 5 for contacting a semiconductor device (during testing of the semiconductor device) or the metal plate (during testing of the probe card pins 5), and a second set of electrodes 6 for connecting to the probe card reader (during testing of

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the probe card pins 5).

Applicant respectfully submits that, compared to the present invention, Hirao is non-analogous art.

A prior-art reference is analogous if

- (1) the art is from the same field of endeavor, regardless of the problem addressed; and
- (2) if not from the same field of endeavor, whether it is still reasonably pertinent to the particular problem to be solved.

E.g., In re Clay, 966 F.2d 656, 658-59, 23 U.S.P.Q.2d 1058, 1060 (Fed. Cir. 1992); MPEP Section 2141.01(a). Applicant respectfully submits that just because Hirao and the present invention relate to electronic devices, does not mean that they are from the same field of endeavor. For example, in the *Clay* case, the Office argued that the prior art patent and the application at issue were part of a common endeavor: maximizing withdrawal of petroleum stored in petroleum reservoirs. The Court held that the art is not within the same field of endeavor merely because both relate to the petroleum industry. The application at issue was for storage of refined liquid hydrocarbons; the prior art patent was for the extraction of crude petroleum. *In re Clay, supra*, at 659, 23 U.S.P.Q.2d at 1060.

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Similarly, in *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 26 U.S.P.Q.2d 1767 (Fed. Cir. 1993), cited at Section 2141.01(a) of the MPEP, the patents-in-suit were for single in-line memory modules. The prior art at issue was for single in-line memory modules. The Federal Court stated, nonetheless:

The Allen-Bradley art is not in the same field of endeavor as the claimed subject matter merely because it relates to memories. It involves memory circuits in which modules of varying sizes may be added or replaced; in contrast, the subject patents teach compact modular memories.

Id. at 864, 26 U.S.P.Q.2d at 1773 (emphasis added). Even though both the application and the prior art reference described SIMMs, they were still different fields of endeavor.

The Hirao reference and the present invention are similarly not in the same field of endeavor. Hirao relates to probe cards for performing a wafer test and chip test of a semiconductor device, and relates to being able to test the individual pins of the probe card itself. As such, two different sets of probe pins are provided on the card. In contrast, the present invention relates to a device for testing a contact ring used in a semiconductor wafer electroplating process. These endeavors are different.

Additionally, the Hirao reference is not reasonably pertinent to the problem to be solved in connection with the present invention. An illustrative case in which prior art was found to be analogous, even though not from the same field of endeavor, is *Medtronic, Inc. v. Cardiac Pacemakers*, 721 F.2d 1563, 220 U.S.P.Q. 97 (Fed. Cir. 1983), cited in Section 2141.01(a) of the MPEP. The patent involved a cardiac pacemaker which included a runaway inhibitor means for preventing a pacemaker malfunction from causing pulses to be applied at too high a frequency

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rate. Two prior-art references disclosed circuits used in high power, high frequency devices which inhibited the runaway of pulses from a pulse source. The court held:

Faced with a rate-limiting problem, one of ordinary skill in the art would look to the solutions of other faced with rate-limiting problems.

Id. at 1573-74.

Hirao and the present invention do not provide solutions to similar problems. Hirao addressed the problem of being able to check the individual pins of a probe card. In contrast, the present invention addresses the problem of quickly testing a contact ring to determine why a deposition non-uniformity is occurring in an electroplating process.

Notwithstanding the fact that Hirao is non-analogous art, the independent claims of the present application have been amended to further distinguish the claimed invention from that which is disclosed in Hirao. Specifically, claim 1 has been amended such that it now specifically claims, among other things, a substrate which is configured such that the substrate is mountable in a contact ring. In contrast, Hirao does not disclose providing a substrate which is mountable in a contact ring. In the Office Action, the Examiner cited the metal plate 102 as being a "substrate". However, unlike what is specifically claimed, the metal plate 102 disclosed in Hirao is not mountable in a contact ring. Additionally, the metal plate 102 does not include a conductive pattern thereon, as is claimed in claim 1. Hirao fails to disclose or suggest providing a substrate which is mountable in a contact ring and includes a conductive pattern.

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In the Office Action, the Examiner identified the circles shown in the middle of the probe card in Figures 4-8 as being a "contact ring". No associated description can be found in Hirao, but Applicant respectfully submits it certainly does not appear that the circles have anything to do with any contact ring which is being tested. Instead, it appears that the circles may merely represent, for example, an aperture in the card which makes the card easier to handle without accidentally touching one of the electrodes 5 or 6. Regardless, even if the circles shown in the middle of the probe card in Figures 4-8 can be said to be a "contact ring", there is no indication that the metal plate 102 (identified by the Examiner as being a "substrate") is mountable in a contact ring, or that the metal plate 102 has a conductive pattern thereon.

Additionally, Claim 1 has been amended such that it now specifically claims, among other things, resistance measurement circuitry configured to not only send test signals to a conductive pattern on the substrate, but also configured to receive signals from the conductive pattern and measure the resistances associated with the electrical contacts of the contact ring. In contrast, while Hirao discloses a "probe card checker", Hirao does not disclose or suggest that the probe card checker both sends test signals and measures the resistances. In fact, Hirao specifically teaches that this is not the case (see Figure 3 of Hirao which indicates current (I) coming in from the top of the diagram, as opposed to coming directly from the probe card checker 101). According to Hirao, a current is applied to the probe card pins, while the probe card checker checks the resistances associated with each pin (see, for example, col. 5, lines 25-42).

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Applicant respectfully submits that claim 1, as amended, is distinguishable from that which is disclosed in Hirao, and that claim 1, and those claims which depend therefrom, are allowable over Hirao.

The other independent claim, claim 12, has been amended similarly to claim 1, but is directed to a method. Applicant respectfully submits that claim 12 is allowable for at least the same reasons why claim 1 is allowable, as discussed above. Among other things, claim 12 specifically claims mounting a substrate in a contact ring thereby electrically contacting at least a portion of a conductive pattern on the substrate with electrical contacts of the contact ring, and having the device not only send test signals to the conductive pattern, but also receive signals from the conductive pattern. As discussed above, while the Examiner has identified the circles shown in the middle of the probe card in Figures 4-8 as being a "contact ring", no associated description can be found in Hirao, and it certainly does not appear that the circles have anything to do with any contact ring which is being tested. Regardless, even if the circles shown in the middle of the probe card in Figures 4-8 can be said to be a "contact ring", there is no indication that the metal plate 102 (identified by the Examiner as being a "substrate") is mountable in a contact ring, or that the metal plate 102 has a conductive pattern thereon. Additionally, as discussed above, while Hirao discloses a "probe card checker", Hirao does not disclose or suggest that the probe card checker both sends test signals and measures the resistances. In fact, Hirao specifically teaches that this is not the case (see Figure 3 of Hirao which indicates current coming in from the top of the diagram, as opposed to coming directly from the probe card checker). According to Hirao, a current is applied to the probe card pins, while the probe card

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checker checks the resistances associated with each pin (see, for example, col. 5, lines 25-42).

Applicant respectfully submits that Hirao neither discloses nor suggests what is now being specifically claimed in claim 12. As such, Applicant respectfully submits that claim 12, as amended, is allowable over Hirao.

In view of the above amendments and remarks, Applicant respectfully submits that the claims of the application are allowable over the rejections of the Examiner. Should the present claims not be deemed adequate to effectively define the patentable subject matter, the Examiner is respectfully urged to call the undersigned attorney of record to discuss the claims in an effort to reach an agreement toward allowance of the present application.

Respectfully submitted,

Dated: August 8, 2005

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